Inquiry and Investigation
Lesson Plan

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Course Name:
7th Grade Integrated
"I Will Survive"

Core Curriculum Standard Fulfilled: Standard IV: Students will understand that offspring inherit traits that make them more or less suitable to survive in the environment.

Core Curriculum Objective Fulfilled: Objective 2. Relate the adaptability of organisms in an environment to their inherited traits and structures.

Intended Learning Outcome (ILO) Fulfilled:

1e: When given a problem, plan and conduct experiments in which they: Identify variables; Collect data on the dependent variables; select appropriate format to summarize data obtained; analyze data and construct reasonable conclusions.
3a: Know and explain science information specified for their grade level.
3b: Distinguish between examples and non-examples of concepts that have been taught.
4a. Provide relevant data to support their inferences and conclusions.
4b. Use precise scientific language in oral and written communications.
4c. Use correct English in oral and written reports.

Time Needed to Complete Inquiry:

Approximately two, 45 minute class periods.

Inquiry: What is the research question to be scientifically investigated and how will your students actively participate? How will you use Guided Inquiry, Semi-guided Inquiry, or Open Inquiry as your teaching method? What are some characteristics that help determine the survivability of a species

Guided Inquiry would be used as some instructions are needed in order for the students to understand and get started on the activity.

Assessment: How will you know that your students have met the objective? Are there application extensions to this activity, interpretive test items, etc?

An assessment extension is to have students, over a period of time, list organisms they observe daily and tell how they have adapted.

Prior Knowledge Needed: What background and skills do the students need to be prepared for this inquiry? How will they obtain it?

Students will have previously discussed the term of adaptation and how organisms have changed over time to adapt to their environment.

Introduction: Tell how you can introduce the inquiry to your students to make it meaningful and relevant

Tell the story of the Pepper Moth and how it adapted in order to survive around London, England, during the Industrial Revolution. Have students look at the pictures of examples of adaptation that are posted around the room

Materials/Resources Needed for the Investigation:

- square sheet of white paper (approximately 10 cm X 10 cm)
- colored pencils
- tape
- graph paper
- scissors

Procedures of the Investigation: Describe the actual investigation. What will the students do? If applicable, identify the independent and dependent variables, the constants, and the repeated trials.

Discuss the term adaptation and how it relates to the pictures posted around the classroom. Talk about the Pepper Moth that was found in England during the Industrial Revolution. Have students divide into groups of 10 – 12 members. Have each group decide on a camouflage/pattern for their butterfly/moth that they think will blend into the surroundings the best and then each member make an identical copy (as close as possible). Then have one group leave the room and another group will put up their butterflies/moths throughout the room in areas where camouflage may work. They have to be in the open, and can't be hidden behind or under anything. Have 2 – 3 predators from the hallway come in and look for the other group's butterflies/moths for one minute taking down and turning in the butterflies/moths as they are found. Then have another group of 2 – 3 predators come in and look. Do this until all the butterflies/moths are found or until everyone in the predator group has had a chance to look for the butterflies/moths. Swap around the order of the groups and continue until every group has been the prey and the predator. Have the prey group collect data on how many of their butterflies/moths were found during each 30 second interval

Data Collection: How will students collect and organize data (tabulation)?

Each prey group will record the numbers of butterflies/moths that were found during each 30 second interval. Also show what color/pattern your group used.

Data Analysis:

Discuss independent variable (color/pattern) and the dependent variable (the number of butterflies caught in the 30 second intervals). Have students graph the results of the groups, determining which color/pattern might have been the best.

Closure: How will you provide closure to the experience? How will students effectively communicate what they have learned?

Have a group discussion on which patterns etc worked best and which didn't and why. Talk about such things as colors, locations (were the butterflies/moths spread out or all in a small area), what was the "aggressiveness" of their predators like, etc. Students will then record these observations in the Discussion section of their lab.

I Will Survive

Name: _____
Period: _____

Purpose of Activity:
To show students how organisms have changed over time to adapt to their environment in order to better survive.

Materials:
- 10 cm X 10 cm piece of white paper
- colored pencils
- scissors
- tape
- graph paper

Procedures:
1. After dividing into groups of 10 – 12 members, look around the room and decide on a place where your group might put your butterflies/moths so they will have the best chance to survive.
2. Using all the piece of paper, cut out your butterfly/moth. Fold it in half and draw one half so it will be symmetrical in shape.
3. Color your butterflies/moths all the same, thinking about where they will be placed to best survive.
4. Track the number of your butterflies/moths that are devoured by the predators every 30 seconds.
5. Graph your groups and the other groups' results on a piece of graph paper.

Discussion:
Discuss which groups butterflies/moths had the best survival rate and why?

_____

_____

_____

_____

During the next week, observe at least six different organisms and tell how they may have adapted to their environment to better survive.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____